W. HIRSCH.

Glass-Annealing and Working-Furnace.

No. 206,109. Patented July 16, 1878.

FIG. II.

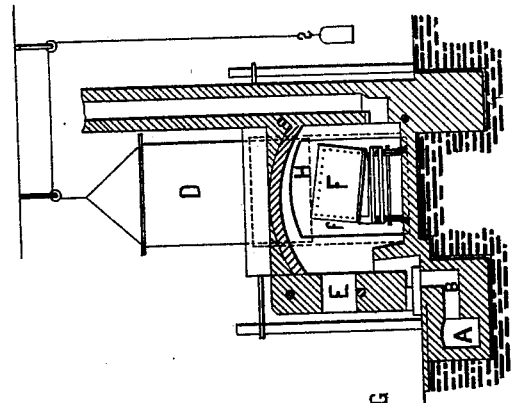
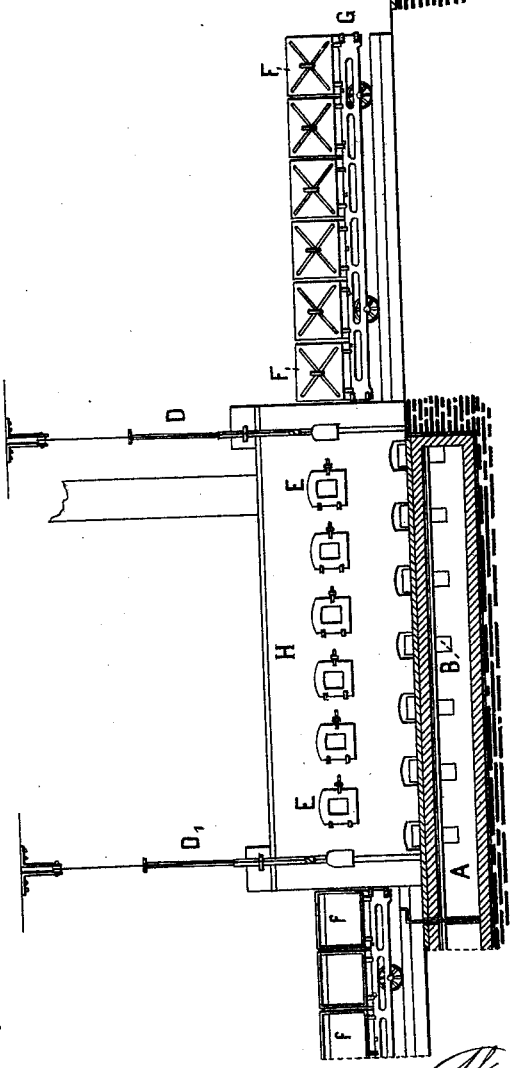


FIG. I.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILHELM HIRSCH, OF RADEBERG, NEAR DRESDEN, SAXONY.

IMPROVEMENT IN GLASS ANNEALING AND WORKING FURNACES.

Specification forming part of Letters Patent No. **206,109**, dated July 16, 1878; application filed June 5, 1878; patented in France, August 13, 1877; in England, January 23, 1878; applicationfiled in Germany, August 6, 1877.

To all whom it may concern:

Be it known that I, WILHELM HIRSCH, of Radeberg, near Dresden, Saxony, have invented an Improved Annealing-Furnace for Glass-Works, of which the following is a specification:

This invention relates to an improvement in annealing-furnaces for hollow glasswares, to the annealing-receptacles employed therewith, and to the method of annealing.

In annealing-furnaces as used at present larger glasswares are commonly placed into the heated furnace, which is then left to cool with its contents, while smaller articles are, by preference, put within the furnace into pots or vessels, which are thereupon gradually removed into cooler parts of the furnace, or lifted out of the same altogether by means of suitable instruments.

According to the present invention, the receptacles for the glass to be annealed in, which are, by preference, made rectangular—*i. e.*, in the shape of a box—are placed on a truck, which is conveyed into the furnace on a line of rails, an opening provided with a sliding door being arranged for this purpose in the end wall of the furnace.

The boxes on the truck having been heated to the proper degree, the glasswares are placed into them through working-holes in the front wall of the furnace, and when they are filled the truck on which they stand is withdrawn from the furnace, either by the opening through which it had been run in, or through another opening opposite to the former. The boxes are then covered by lids and left to cool in the glass-house, or in any other convenient place outside of the furnace. After the removal of the truck with the filled boxes, another truck is conveyed into the furnace. The work may thus proceed with but a single annealing-furnace, which is always kept at the same temperature. The boxes are open on the side toward the working-holes of the furnace, and they stand slightly inclined on the trucks, the open side being raised, so as to prevent the glasswares from falling out.

On the annexed sheet of drawings an annealing-furnace of the described kind, with the appertaining trucks and receptacles for glasswares, is represented in elevation, Figure 1, and in vertical section, Fig. 2.

H is the furnace, which is heated by gas entering by the channels A and B. Any other mode of heating the furnace may, however, be employed.

D and D′ are the sliding doors, provided with counterbalance-weights for closing the apertures through which the trucks G, with the annealing-boxes F, are introduced and withdrawn. At the left-hand end of the furnace these boxes are represented uncovered, while at the other end they are shown closed by their lids. The boxes are open at the side *f*, opposite to the working-holes E in the side wall of the furnace, so as to permit of an easy introduction of the articles to be annealed, and they stand inclined on the truck, in the manner shown by Fig. 2.

As the boxes can, with facility, be conveyed into and out of the furnace by means of the trucks, their size and weight are of no material consideration in this respect. The walls of the same may consequently be made sufficiently thick to allow of their being exposed to the ordinary temperature of the glass-house without causing them and their contents to cool too rapidly, as may easily occur with the aforesaid pots, which have to be lifted out of the furnace by hand, and therefore cannot conveniently exceed a certain weight.

The described furnace requiring no change of temperature, it causes a great saving of fuel, as compared with furnaces requiring an alternate heating and cooling. Moreover, a single furnace of the former kind supplies the place of several of the latter sort.

The annealing-boxes may, with advantage, be made of such a size and thickness of walls that while the series on one truck is being filled, the boxes on the other truck may cool and be emptied, so that only two trucks are required in this case. For large and heavy glasswares it may, however, be preferred to have annealing-boxes of larger size and thicker walls, so as to cause them to cool more slowly, and in this case a larger number of trucks will be wanted.

It may yet be observed that in the described method of annealing glasswares no cooling-

shambers whatever are combined with the furnace, so that the same is reduced to the smallest size possible.

I claim as my invention—

1. In combination with an annealing-furnace for glassware, consisting of a single chamber having working-holes E, the boxes or receptacles F, placed on trucks G, substantially as and for the purpose stated.

2. The combination, with the chamber of an annealing-furnace, of the trucks G, supporting the boxes or receptacles F thereon in an inclined position, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILHELM HIRSCH.

Witnesses:

LÉON KLEMPERER,

PAUL DENCKMÜLLER.